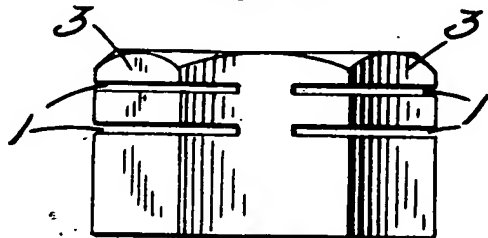


SHEET 1

2 SHEETS

SHEET 2

FIG. 11.

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FIG. 12.

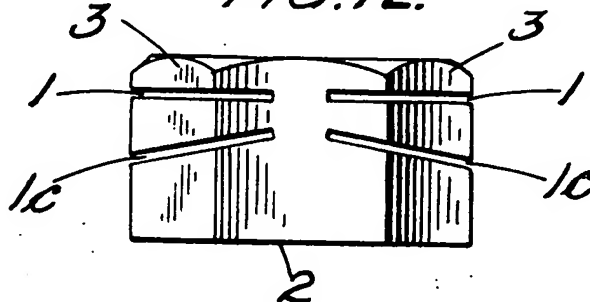


FIG. 13.

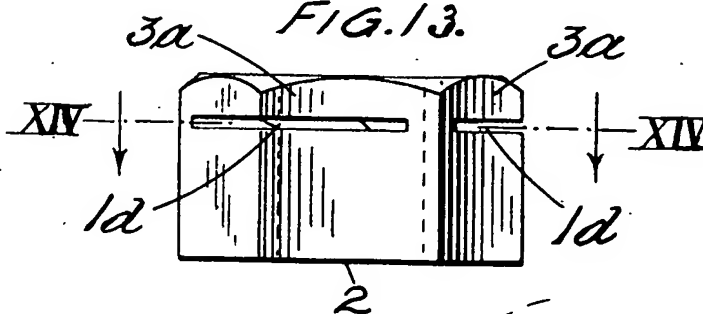
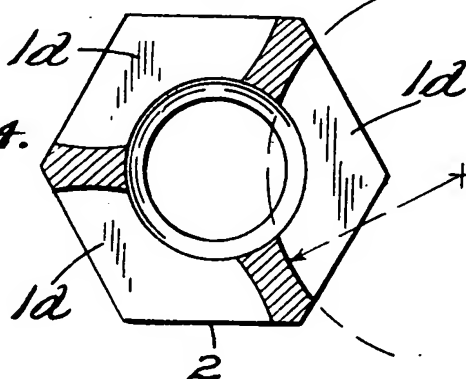
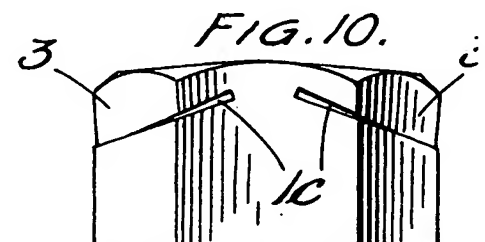
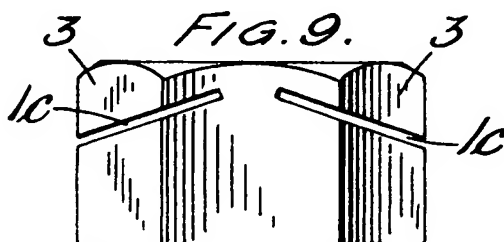
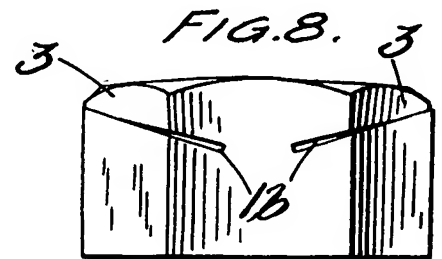
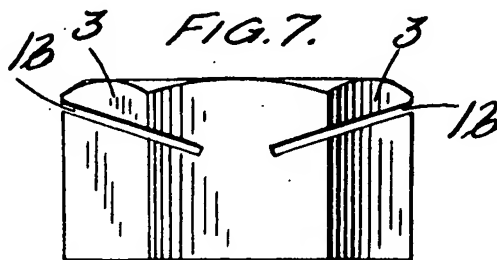
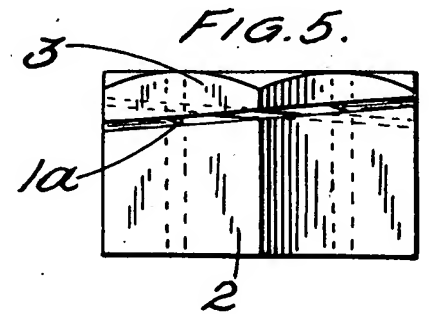
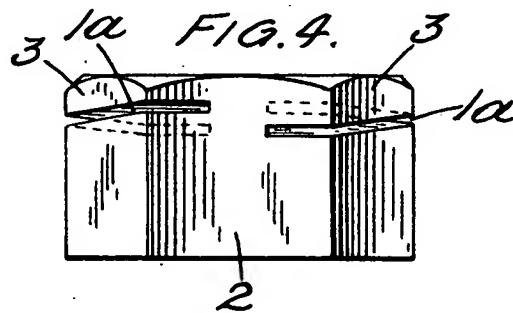
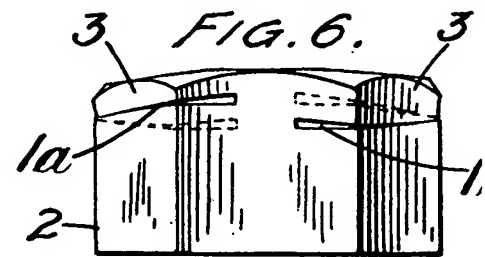
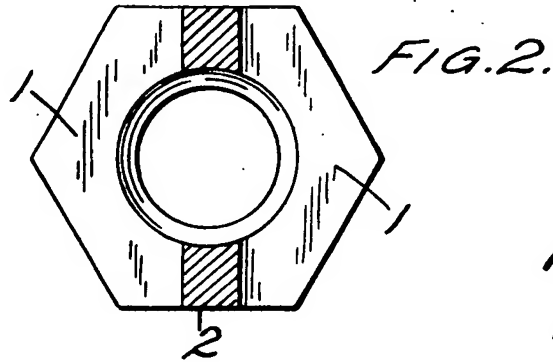
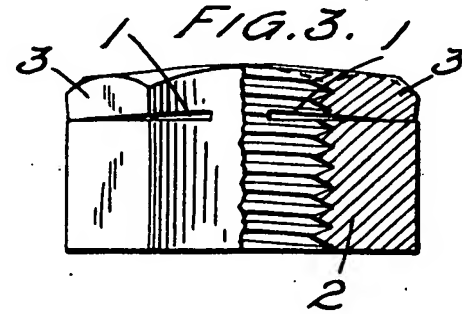
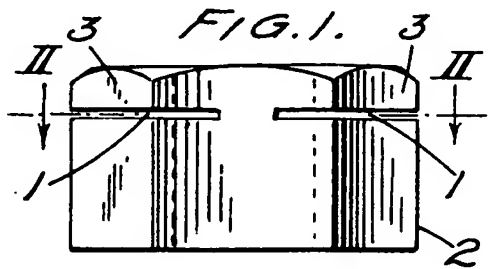


FIG. 14.





[This Drawing is a reproduction of the Original on a reduced scale.]

100/15  
21

# PATENT SPECIFICATION

57  
51



Application Date: Aug. 29, 1941. No. 11049/41.

551,534

" " May 18, 1942. No. 6709/42.

One Complete Specification Left (Under Section 16 of the Patents and Designs Acts, 1907 to 1942): July 31, 1942.

Specification Accepted: Feb. 26, 1943.

## PROVISIONAL SPECIFICATION

No. 11049 A.D. 1941.

### Improvements in or relating to Lock Nuts

We, R. K. DUNDAS LIMITED, a British Company, of Airport, Portsmouth, in the county of Hants, RONALD DOUGLAS KING, a British subject, and NORMAN FREDERICK WOOD, a British subject, both of the Company's address aforesaid, do hereby declare the nature of this invention to be as follows:—

This invention relates to lock nuts.

10 The object of the invention is to provision of an improved lock nut which will be simple, effective and inexpensive and can be readily produced.

The invention consists broadly of a nut 15 having formed in it, in a plane transverse to its axis, one or more saw cuts preferably extending far enough inwards to open into the tapped hole, which saw cuts, subsequently to their formation are closed 20 by knocking the nut at one end. The threads on the distorted portion are thus thrown at an angle and, when the nut is subsequently screwed on to the bolt, act as spring threads to lock the nut.

25 In accordance with one embodiment of the invention, two opposite and equal saw cuts are made in an ordinary nut, in a common plane at right angles to the axis of said nut and near to one end of said nut, said saw cuts extending at least sufficiently close together to open into the 30 tapped hole of the nut round a consider-

able proportion of its circumference. Thus the nut may be said to be formed at one end with two wings each of nearly 35 semi-annular formation separated from the main portion of the nut by the two saw cuts. Before the nut is screwed up, these two wings are knocked inwards and/or axially by means of a hammer or other 40 suitable instrument so that the saw cuts are more or less closed, and, in this way the thread portions in the wings are thrown at an angle and act as spring 45 threads to lock the nut when it is subsequently screwed on to the bolt. It will be appreciated that the main body of the nut is in no way weakened. The nut can be 50 screwed on from either end and distortions of the thread of the bolt do not im-

pair the operation. If the wings become deformed they can easily be re-set, by a blow with a spanner or hammer.

It will be appreciated that the inven- 55 tion may be applied to any existing ordinary nut, such as a castle nut, thin or round nut or any specially shaped nut.

Dated this 29th day of August, 1941.

A. A. THORNTON,  
Chartered Patent Agents,  
7, Essex Street, Strand, London, W.C.2,  
For the Applicants.

## PROVISIONAL SPECIFICATION

No. 6709 A.D. 1942.

### Improvements in or relating to Lock Nuts

We, R. K. DUNDAS LIMITED, a British 60 Company, of the Airport, Portsmouth, in the county of Hants, and RONALD DOUGLAS KING, a British Subject, and NORMAN FREDERICK WOOD, a British Subject, both of the Company's address, 65 of the Airport, Portsmouth, in the county of Hants, do hereby declare the nature of this invention to be as follows:—

This invention relates to lock nuts. In our prior provisional specification No. 70 11049/41 (Serial No. 551,534), the nature is described of a lock nut having formed

in it, in a plane transverse to its axis, one or more saw cuts, preferably extending far enough inwards to open into the 75 tapped hole, which saw cuts, subsequently to their formation, are closed by knocking the nut at one end. The threads on the distorted portion are thus thrown at an angle, and, when the nut is subsequently 80 screwed on to the bolt, act as spring threads to lock the nut.

The object of the present invention is the provision of an improved nut of this character which can be used for a longer

[Price 1/-]

period without its threads or those of the bolt on which it is screwed becoming worn. In accordance with the invention each saw cut is inclined slightly to the plane at right angles to the axis of the nut in such a way as to be more or less parallel to the screw threads.

In accordance with one embodiment of the invention, the nut may be exactly the same as the embodiment of the invention particularly described in the prior provisional specification aforesaid except that each of the two opposite and equal saw cuts, instead of being in a common plane at right angles to the axis of the nut are inclined so as to be substantially

parallel to the screw threads. The average level of the two saw cuts will preferably be substantially the same.

The inclination of each saw cut may be only in respect of its length, its plane being at right angles to the axis of the nut in respect of its depth, or each saw cut may be inclined as far as possible parallel to the screw threads in respect both of its length and its depth.

Dated this 18th day of May, 1942.

A. A. THORNTON,  
Chartered Patent Agents,  
7, Essex Street, Strand, London, W.C.2,  
For the Applicants.

## COMPLETE SPECIFICATION

### Improvements in or relating to Lock Nuts

We, R. K. DUNDAS LIMITED, a British Company, of Airport, Portsmouth, in the county of Hants, RONALD DOUGLAS KING, a British subject, and NORMAN FREDERICK WOOD, a British subject, both of the Company's address aforesaid, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to self-locking or "stiff" nuts, that is to say nuts which bind sufficiently tightly on the bolt to ensure that they shall not become accidentally loosened as a result of vibration or like causes. The object of the invention is the provision of an improved nut of this character which will be simple, effective and inexpensive and can be readily produced.

The invention consists broadly of a nut having formed in it transversely to its axis a plurality of saw cuts extending towards one another and far enough inwards to open into the tapped hole but not as far as the axis, which saw cuts, subsequently to their formation and before being screwed on to the bolt, are fully closed. By closure of the saw cuts threads on the distorted portion are thrown at an angle and, when the nut is subsequently screwed on to the bolt, act as spring threads to grip tightly the threads of the bolt and prevent accidental loosening as stated.

In order that the invention may be the more clearly understood certain embodiments thereof will now be described, reference being made to the accompanying drawings wherein:—

Figure 1 is a side elevation of a nut according to the invention before the closure of the saw cuts.

Figure 2 is a cross-section on line II—II of Figure 1.

Figure 3 is a side elevation, shown partly in section, of the nut after the closure of the saw cuts.

Figure 4 is a side elevation of a modified form of nut in accordance with the invention before closure of the saw cuts.

Figure 5 is an elevation of the same looking from the right of Figure 4.

Figure 6 is a similar view to Figure 4 of the same after closure of the saw cuts.

Figures 7 and 8 are side elevations of another modified form of nut in accordance with the invention, before and after closure of the saw cuts.

Figures 9 and 10 are side elevations of another modified form of nut in accordance with the invention, before and after closure of the saw cuts.

Figures 11 and 12 are side elevations of respective further modified forms of nut in accordance with the invention the saw cuts in these Figures being shown only before closure.

Figure 13 is a side elevation of another nut according to the invention before closure of the saw cuts.

Figure 14 is a cross-section on line XIV—XIV of Figure 13.

Referring first to Figures 1 to 3, two opposite and equal saw cuts 1 are made in an ordinary nut 2, in a common plane at right angles to the axis of said nut and near to one end of said nut as shown, said saw cuts each starting at an angle as distinct from a face of the nut as shown, and extending at least sufficiently close together to open into the tapped hole of the nut round a considerable proportion of its circumference. Thus the nut may be said to be formed at one end with two wings 3 each of nearly semi-annular formation and having an angle at its tip,

separated from the main portion of the nut by the two saw cuts. Before the nut is screwed up, these two wings 3 are knocked by means of some suitable instrument so that the saw cuts 1 are fully closed as shown in Figure 3, and in this way the thread portions in the wings are thrown at an angle and act as spring threads when the nut is subsequently screwed on to the bolt to grip tightly the threads of the bolt and prevent accidental loosening. It will be appreciated that the main body of the nut is in no way weakened. The nut can be screwed on from either end and distortions of the thread of the bolt do not impair the operation.

If the wings 3 become deformed they can easily be re-set, by a blow with a suitable instrument.

It will be appreciated that the invention may be applied to any existing ordinary nut, such as a castle nut, thin or round nut or any specially shaped nut. It is particularly to be noted that as the saw cuts 1 are close to one end of the nut the main body of the nut will remain strong enough although the nut may be of ordinary shallow depth.

Another point to note is that the nut can be screwed on and off a large number of times.

Referring to Figures 4, 5 and 6, the embodiment illustrated in these Figures differs from that just described only in that each saw cut 1a is inclined slightly to the plane at right angles to the axis of the nut in such a way as to be as far as possible parallel to the screw threads. The effect of this is that the nut can be subjected to more use without its threads or those of the bolt on which it is screwed becoming worn. It will be seen that the average level of the two saw cuts 1a is the same.

The saw cuts need not necessarily be cut into the nut in planes at right angles to the axis as in Figures 1 to 3 or in planes parallel to the screw threads as in Figures 4 to 6, but could in some cases be cut at oppositely inclined angles. Figures 7, 8 and 9, 10 show examples of this, the saw cuts 1b of Figures 7, 8 being inclined away from, and the saw cuts 1c of Figures 8, 10 being inclined towards, the adjacent end of the nut as clearly shown.

A simple way of bending the wings to the main portion of the nut is to thread the nut on to a vertical rod extending upwards from a base so that the nut rests on the base with the wings upwards, and then permit a "dolly" with a suitably shaped base to slide by gravity down the rod from a given height and fall on to the wings of the nut.

The invention is not necessarily limited to there being only a single pair of saw cuts. In some cases there could be two pairs of saw cuts at different levels as shown in Figures 11 and 13, each of which shows a nut with a second pair of opposite slots located underneath the first pair. In Figure 11 the slots 1 of each pair are cut at right angles to the axis of the nut as in Figure 1, the slots of both pairs being started at an angle of the nut, and the slots of the two pairs are exactly superimposed. Figure 12 is similar to Figure 11 except that the slots 1c of the underneath pair are inclined at an angle as in Figure 10. In these Figures 11 and 12, the slots may be closed by means of a "dolly" as described above, the impact being adjusted so as to be sufficient to close the slots of both pairs simultaneously.

There could of course be even more than two pairs of slots at different levels, but a single pair is usually preferred as it involves less weakening of the nut and leaves a longer uninterrupted main portion while giving a perfectly efficient grip or drag on the bolt.

Still another form of the invention is illustrated in Figures 13 and 14 which illustrate an arrangement in which there are three equal saw cuts 1d in a common plane at right angles to the axis of the nut and near one end. As will be clear from the drawing the saw cuts are formed by means of a small diameter saw having a diameter of say the same order as that of the nut. The cuts are equally spaced at intervals of 120° round the nut and, as shown, they cut into angles of the nut. As in the preceding arrangements the cuts of course open into the tapped hole. In this case three wings 3a are formed. As in the preceding arrangements, before the nut is screwed up these wings 3a are knocked down by a dolly so that the saw cuts are fully closed. Obviously the set of these cuts could be duplicated in a second plane in a manner analogous to Figures 11 and 12. Again in the case of the circular saw cuts 1d they need not necessarily be in a plane at right angles to the axis of the nut.

It will be appreciated that in every case the saw cuts stop short of the axis of the nut.

We are aware that a self-locking nut of the character set forth has heretofore been proposed, consisting of a nut having formed in it transversely to its axis a plurality of saw cuts, extending towards one another far enough inwards to open into the tapped hole but not as far as the axis, which saw cuts subsequently to their formation and before being screwed on to

the bolt are partly closed.

We are also aware that a self-locking nut of the character set forth has been heretofore proposed, consisting of a nut having formed in it transversely to its axis a plurality of saw cuts, extending inwardly far enough to open into the tapped hole, which saw cuts subsequently to their formation and before being screwed on to the bolt, are fully closed, but in such proposals said saw cuts have extended well beyond the axis of the nut and have accordingly overlapped one another.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A self locking or "stiff" nut of the kind set forth, consisting of a nut having formed in it transversely to its axis a plurality of saw cuts, extending towards one another and far enough inwards to open into the tapped hole but not as far as the axis, which saw cuts subsequently to their formation and before being screwed on to the bolt are fully closed.

2. A nut according to claim 1, wherein the saw cuts are each started at an angle as distinct from a face of the nut.

3. A nut according to either of the preceding claims, wherein said saw cuts are two opposite saw cuts and are close to one end of the nut, so that the nut is formed at one end with two wings each of nearly semi-annular formation separated from the main portion of the nut by the two saw cuts, and the said wings are bent towards the main portion of the nut for closing the saw cuts.

4. A nut according to any of the pre-

ceding claims, wherein said saw cuts are in a common plane at right angles to the axis of the nut.

5. A nut according to any of claims 1 to 3, wherein said saw cuts are two opposite saw cuts and each is inclined to the plane at right angles to the axis of the nut.

6. A nut according to claim 5, wherein each saw cut is as far as possible parallel to the screw threads.

7. A nut according to claim 5, wherein the two saw cuts are inclined in opposite directions.

8. A nut according to claim 7, wherein the two saw cuts are inclined away from the adjacent end of the nut as they approach one another.

9. A nut according to claim 7, wherein the two saw cuts are inclined towards the adjacent end of the nut as they approach one another.

10. A nut according to claim 1 or 2, wherein said saw cuts are three saw cuts cut with a small circular saw substantially as described.

11. A nut according to claim 10, wherein said three saw cuts are in a common plane at right angles to the axis of the nut and near one end of the nut.

12. A nut according to claim 10 or 11, wherein there are additional saw cuts in a different plane substantially as described.

13. A self locking or "stiff" nut substantially as herein described with reference to any of the modifications in the accompanying drawings.

Dated this 31st day of July, 1942.

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